

REMARKS

The amendments to pages 5 and 6 of the Specification and Fig. 1 of the drawings in which the frame has a first portion 9a and a second portion 9b is supported by the paragraph in page 6 lines 17-18 of the specification and in originally filed Fig. 1.

Claims 5 and 18 are characterized by a structure and a method in which a spot joining device is provided with a frame having a first portion and a second portion, fixed to a lower end of the first portion, to extend downwardly in a substantially L-shape, a linear guide provided on the first portion of the frame for guiding the joining tool to be movable upwardly and downwardly along the axis thereof, a rotation motor for rotating the joining tool around the axis thereof, a motion motor for moving the joining tool along the axis thereof, and a column-shaped receiving member provided in a tip end portion of the second portion of the frame such that an upper surface thereof is opposed to the joining tool, and configured to receive lapped works. With this construction, when the spot joining device is used as a spot joining gun by attaching the spot joining device on a polyarticular robot at its wrist, the spot joining device is positioned so that the receiving member receives a joint spot of lapped works to be joined, and the joining tool is then made to move forward while rotating, to fiction-stir the joint spot of the lapped works to be joined and move backwards, thereby allowing the joint spot to be spot joined. In this case, since the joining tool and the receiving member for the works to be joined are provided in one frame so as to be opposite to each other, the spot joining device can be easily moved to, and carry out the joining operation at, a number of joint spots on the works to be joined. Further, since the joining tool moves forwardly and backwardly with respect to the lapped works to be joined that are received by the receiving member, there is no need for moving the works to be joined, and therefore a joining operation can be easily carried out.

On the other hand, the frame 51 disclosed in Wykes is formed such that the second portion protrudes laterally from a column-shaped first portion so as to entirely form an L-shape. The spot joining device claimed herein, therefore, is patentably different from the structure shown in Wykes since the claimed second portion 9b of the frame extends downwardly from a lower end of the first portion in a substantially L-shape. In Wykes, the receiving member 50 is formed in a table-shape, and is different from the column-shaped receiving member claimed herein. This is because the joining device in Wykes is not

intended for spot joining. Unlike in the joining device claimed in this application, the joining device in Wykes, thus structured, is less suitable for use as a device attached on a polyarticular robot at its wrist and is not configured to perform spot joining. For this reason, Wykes neither discloses nor suggests the invention now defined in claims 5 and 18 of this application.

In Okamura et al., inverted-L-shaped frames (75, etc.) are mounted to be movable on a receiving member 76, and is different from the frame of this application in which the second portion is fixed to a lower end of the first portion to extend downwardly in a substantially L-shape. In Okamura et al., a receiving member 76 is formed in a table-shape, and is different from the column-shaped receiving member of this application. This is because the joining device in Okamura et al., like Wykes, also is not intended for spot joining. The joining device in Okamura et al., thus structured, is less suitable for use as a device attached on a polyarticular robot at its wrist and configured to perform spot joining. For this reason, Okamura et al. neither discloses nor suggests the invention now defined in claims 5 and 18 of this application.

Furthermore, Aota et al. and Ezumi et al. neither disclose nor suggest the frame and the receiving member recited in claims 5 or 18 of this application.

Therefore, the spot joining device in claim 5 and the method for spot joining in claim 18 are neither anticipated by nor obvious from any cited prior art.

The method of manufacturing an outer plate of an automobile, now set forth in claim 26 is characterized by having "a concave portion substantially conforming in shape to an outer shape of the pin and the shoulder portion" at a joint spot. As shown in Fig. 4 of this application, an appropriate joining strength is obtained by performing a spot joining in a condition in which the concave portion is spot joined to substantially conform in shape to an outer shape of the pin and shoulder portion of the joining tool. (See page 9, lines 5-23 of the specification.) On the other hand, a dent disclosed in Ezumi et al. and Okamura et al. is filled with a stirred material and is completely different from the concave portion formed in accordance with the method claimed herein. Therefore, Ezumi et al. and Okamura et al. neither disclose nor suggest the outer plate of an automobile formed by the method now set forth in claim 26. For this reason, the method of manufacturing an outer plate of an automobile in claim 26 is neither anticipated by, nor obvious from any cited prior art.

It is submitted that all claims are now of proper form and scope for allowance. Early and favorable consideration is respectfully requested.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 13-2855, under Order No. 19036/37333 from which the undersigned is authorized to draw.

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Respectfully submitted,

By Richard H. Anderson

Richard H. Anderson

Registration No.: 26,526

MARSHALL, GERSTEIN & BORUN LLP

233 S. Wacker Drive, Suite 6300

Sears Tower

Chicago, Illinois 60606-6357

(312) 474-6300

Attorney for Applicant